Configuring WarnGen to Include Decision Support Events in Warnings in AWIPS 1

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1. Introduction

Decision Support Services continue to take a larger role in day-to-day operations at the local WFO. Previous attempts at including Decision Support Events directly in the warnings were undertaken by the Central Region WarnGen Tiger Team (Kurimski et al. 2013) and included a selection to include a special heads-up for outdoor events. However, with an increased DSS role and growing numbers of large events, keeping track of these events to include in our warnings has become increasingly difficult and time consuming. Several previous efforts have made all DSS events and large event venues available to AWIPS for inclusion in a warning. Unfortunately, these solutions would mention events or venues, even when no event was ongoing and made no discretion of attendance. In an attempt to improve upon these efforts, this project expands upon previous groundbreaking work performed by Doug Speheger (2004; 2005) Evan Bookbinder (2011-2013) and Mike Dangelo (2013) to allow adaptable, dynamic displays within AWIPS. By introducing date/time based logic, and WarnGen flagging, we have developed a solution that allows the integration of DSS events into AWIPS on a dynamic approach, and one that is expandable toward more novel housekeeping efforts, such as Google Calendar.

2. Purpose

There are two main objectives accomplished with this software.

1.) Provide dynamic AWIPS D2D map displays of DSS activities across a CWA, allowing forecasters to enhance decision support via the direct integration of the DSS location with meteorological analysis.
2.) Allow for the automated integrated of selected, active DSS events into short-fuse warnings.

3. Getting setup

The AWIPS focal point, ITO and/or ESA will need to decide where to install this local app. A common NFS mounted point should be used, such as /data/local or /awips/dev/localapps. The authors chose /data/local/WarnGen/DSS. You are welcome to install the software components as desired by your office, with just a couple edits necessary to the underlying scripts.

a. Create your directory as user ‘fxa’, and untar the AWIPSDSS.tar delivery file into it.

tar -xvf AWIPSDSS.tar

Once completed you should see the following directory listing:

warngen_dss_include.txt
warngen_dss_marine_include.txt
DSSEvents.txt
decisionSupportToAWIPS.csh
decisionSupportToAWIPS.tcl
process_gelt_files.pl
LOGS/

b. Edit the decisionSupportToAWIPS.csh file and **edit the progdir path, if necessary**.
c. Edit the decisionSupportToAWIPS.tcl file. Note the two variables nulllat and nulllon near the top of the document. These control a lat/lon location, somewhere in the middle of your CWA, where the D2D will display "NONE" and a timestamp if there are no active DSS Events present in the selected time frame. **Edit the values inside the quotes** to a location inside your CWA (preferably away from a county border), and **save this file**.
d. Edit the process_gelt_fiels.pl file. Around line 10 notice a comment line ### EDIT THESE THREE VARIABLES/ARRAYS AS NECESSARY.
    1. **Modify progdir to reflect the install folder**
    2. **Modify @WFOlist to reflect your WFO**
    3. **Modify @ws to reflect your graphical workstations running WarnGen. Note each workstation is contained in single quotes and separated by a comma.**

Save this file.

4. The DSS Master Events File

We have created a very simple format for the DSS Master Event that allows it to be created manually with ease, or even automatically via a script (such as a PHP script communicating with a DSS Google Calendar). There is no need to worry about the strict format of AWIPS's WarnGen and D2D mapping files because the software creates them automatically from this master file.

Each "event" contains 7 comma delimited fields spanning two lines (for clarity): A name, a beginning date/time, an ending date/time, latitude, longitude, a WarnGen flag, and a progressive disclosure value. A few examples are provided in the included DSSEvents.txt file. Note, lines beginning with a # sign are considered comments and will be ignored.

The file format is as follows:

MM/DD/YYYY HH:NN,MM/DD/YYYY HH:NN,wgflag
xx.yyyyy,-xx.yyyyy,DDD,Event Name

Where:

MM/DD/YYYY HH:NN is a date/time stamp in LOCAL TIME matching the FXA_LOCAL_TZ variable on your AWIPS system. For example, if this variable is CST6CDT then:
02/05/2013 00:30 would be 12:30 AM CST on Feb 5th 2013
07/04/2013 21:00 would be 9:00 PM CDT on July 4th 2013

The first date/time stamp marks the beginning of the event, the second stamp the ending.

wgflag = 0, 1, 2, or 3.

0 means do not include this event in WarnGen but include it on D2D
1 means include it as a land based point in WarnGen
2 means include it as a marine based point in WarnGen
3 means include the event as both a land and marine based point in WarnGen.

xx.yyyy = a decimal latitude, followed by a decimal longitude to any number of decimal places.
DDD = A progressive disclosure value (any integer of 0 or greater). It determines how likely an object is to be plotted on a given zoom level on the D2D. Making these all the same (such as 1000) is perfectly acceptable.
Event Name = A plain English name of the event. Keep in mind this will be used in the D2D plot and in WarnGen, and should reflect what people will understand. A landmark is always best (i.e. KAUFFMAN STADIUM vs. ROYALS HOME GAME) as the latter in this case wouldn't make much sense in a warning.

5. Including Events in WarnGen

Once the scripts have run successfully your WarnGen templates need to be modified to include a selection for your DSS events.

NOTE: If you have installed the latest set of CR templates from 2014 you do not need to complete this step. You can skip ahead to Step 6.

A suggested place for this selection is below your Pathcast/cities option, or to replace your "Special heads-up for outdoor event" selection in the current set of Central Region templates. Suggested templates to include this coding are your TOR, SVR, SVS and SPS templates.

a. Add the following code to the TOR, SVR and SPS templates

```
{=THOSE ATTENDING=^ Decision Support Events |
#include "/data/local/WarnGen/DSS/warngen_dss_include.txt"
}
```

b. Add the following code to the SVS template

```
{=THOSE ATTENDING= Decision Support Events [toggle $$ACT_VAL!.eq.CON]|
#include "/data/local/WarnGen/DSS/warngen_dss_include.txt"
}
```

Different coding is required here to ensure the events do not show up in your cancellation/expiration segments.

If you are a marine site and want to include marine DSS events in your SMW and MWS templates complete sections **c** and **d**, otherwise skip to section **e** to run localization.

c. Add the following code to the SMW, and stand-alone MWS templates

```
{=THOSE ATTENDING=^ Decision Support Events |
#include "/data/local/WarnGen/DSS/warngen_dss_marine_include.txt"
}
```

d. Add the following code to the MWS to follow-up a SMW template

```
{=THOSE ATTENDING= Decision Support Events [toggle $$ACT_VAL!.eq.CON]|
#include "/data/local/WarnGen/DSS/warngen_dss_marine_include.txt"
}
```

e. On each workstation that is WarnGen capable, run the following command to instantiate the new templates:

/awips/fxa/data/localization/scripts/mainScript.csh -wwa

6. Setting up the cron

We now need to automate the creation of the map and WarnGen data files. Before we setup the cron, it's best to make sure that the software is working correctly since there were several variables/program paths you may have edited. From the working directory where you installed the software, run the main program script:

./decisionSupportToAWIPS.csh

If successful, you should see the .lpi and .id files created in this directory with no error messages. GREAT!

Now, you will need to setup a cron to run every 30 minutes to re-populate the active WarnGen tables and your D2D maps. It takes the script a fraction of a second to run with negligible CPU usage, and then it copies files to all the workstations (takes about 2 seconds each).

Since this is a local app, it's probably best to place the cron on either of the PXs. Please refer to Chapter 11.1.4 of the AWIPS System Manager's Manual (**165.92.25.138:85/smmob9/toc.html** from the AWIPS Mozilla Broswer) for editing crons on the PXs, and ensuring proper activation and failover. **YOU NEED ROOT PERMISSION TO PERFORM THIS TASK.**

The two line cron entry looks like this (**editing the path as necessary**):

```
#Cron to create Decision Support Files for WarnGen/D2D
00,30 * * * * fxa csh -c '/data/local/WarnGen/DSS/decisionSupportToAWIPS.csh >
/dev/null'
```

7. Displaying DSS Events on D2D

In addition to pulling DSS Events into your WarnGen products, sites may also wish to view these events on their D2D screen. From the master list of DSS Events discussed in section 4, the software will automatically create D2D displays of DSS Events for Today, Tomorrow and the upcoming week. Sites may also wish to set up a static file showing all of their Large Venues and all DSS Events for the entire year. We will go through the steps to create the static file and how to configure D2D to display the static and dynamic DSS Events on D2D.

8. Adding static DSS Events and Venues

In order to get your events and venues to display we need to start by creating an .lpi file. In the tar package you will notice two files:

decEvents.lpi
decSupport.lpi

Which are the files we used to display my events and venues. These .lpi files are a bit different than the .id files we used previously and use this format:

```
42.067558 -84.243481 50  MICHIGAN INTERNATIONAL SPEEDWAY
42.745221 -83.372408 50  DTE MUSIC STAGE
42.339252 -83.048874 50  COMERICA PARK
```

Unlike the .id file which restricts lat/long out to 3 decimal places, the lpi files can use 6 decimal places for lat/long values. The number between the lat/long and the name of the event/venue is the goodness value which determines when an event will show up in D2D. A higher number means the event will show up when zoomed out and a lower number means you will need to zoom in to see the event. You can create one or both of these files to see the large events/venues in your cwa based on the example files provided. Once these files are created place them in the /data/fxa/nationalData directory.

9. Configuring D2D

We will need to perform a one-time configuration of AWIPS to allow for the display of these three maps.

a. We need to pick 3 unique product numbers (also known as keys) between 1000 and 1999 which are not already in use. If you have previously added unique displays/maps to your AWIPS system, you are already likely familiar with this task. The following are places to search to see if the keys you have selected are already in use:

   In /data/fxa/nationalData/:
   - productButtonInfo.txt
   - dataInfo.manual
   - depictInfo.manual
   - backgroundMenus.txt

   In /awips/fxa/data/localization/XXX/: (where XXX is your site ID. These files should generally NOT exist on most AWIPS systems)

XXX-localProductButtons.txt
XXX-localDataKeys.txt
XXX-localDepictKeys.txt
XXX-otherBackgroundMenus.txt

In /data/fxa/customFiles/: (if the files exist)
localProductButtons.txt
localDataKeys.txt
localDepictKeys.txt
otherBackgroundMenus.txt

b. Once you verify the chosen keys are not in use, you can edit the files in /data/fxa/customFiles. NOTE: Please make backups of the following files before proceeding!

localProductButtons.txt
localDataKeys.txt
localDepictKeys.txt
otherBackgroundMenus.txt

In this example we used the following keys: 1204 - 1208. First we will edit the **/data/fxa/customFiles/localProductButtons.txt** file**. Adding the following entries.**

```
1204    | <3000, 1204          |Today's DSS Events          | Today's DSS Events          |1
1205    | <3000, 1205          |Tomorrow's DSS Events       | Tomorrow's DSS Events       |1
1206    | <3000, 1206          |This Week's DSS Events      | This Week's DSS Events      |1
1207    | <3000, 1204          |Large Event Venues          |Large Event Venues         |1
1208    | <3000, 1205          |Decision Support Events     |Decision Support Events    |1
```

c. Next, add 3 lines to the **/data/fxa/customFiles/localDataKeys.txt** file

```
1204  |        | | | | | | |dssevents_today      |.lpi|Today DSS
1205  |        | | | | | | |dssevents_tomorrow   |.lpi|Tomorrow DSS
1206  |        | | | | | | |dssevents_week       |.lpi|This Week DSS
1207  |        | | | | | | |decSupport           |.lpi|Large Venues
1208  |        | | | | | | |decEvents            |.lpi|Decision Support
```

d. Then we add these three lines to the **/data/fxa/customFiles/localDepictKeys.txt** file

```
1204 |5 |1204| |         |1 |Todays DSS Events      | Todays DSS Events     |1 |1 |1 |
1205 |5 |1205| |         |1 |Tomorrows DSS Events   | Tomorrows DSS Events  |1 |1 |1 |
1206 |5 |1206| |         |1 |This Weeks DSS Events  | This Weeks DSS Events |1 |1 |1 |
1207 |5 |1207| |         |1 |Large Event Venues     |Large Venues           |1 |1 |1 |
1208 |5 |1208| |         |1 |Decision Support Events|Decision Support       |1 |1 |1 |
```

e. Finally, we added this to the otherBackgroundMenus.txt file to get the map entries to show up on the D2D Maps menu:

```
submenu: "DTX Decision Support"
productButton: 1207 # Large Event Venues
productButton: 1208 # All Decision Support Events
title: "** DSS Activities **"
```

```
productButton: 1206 # Todays DSS Events
productButton: 1208 # Tomorrows DSS Events
productButton: 1209 # This Weeks DSS Events
endSubmenu
```

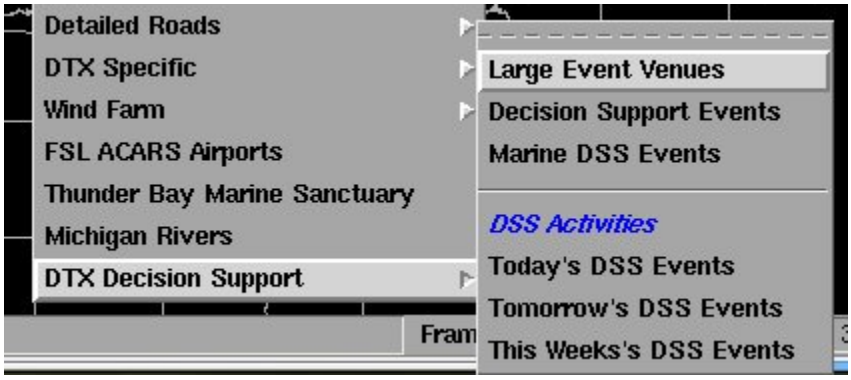
Note that we used a submenu for Decision Support since our Maps menu has grown quite large. This means the new buttons show up as a pop-out menu when you select DTX Decision Support.

f. The final step is to run a forced localization with the -tables and -maps options to get these changes to show up.

On each workstation that is D2D capable, run the following command:

/awips/fxa/data/localization/scripts/mainScript.csh f -tables -maps

Restart D2D to get the changes to show up. If you are successful the changes will show up in your Maps pull-down menu with the sites showing up on your D2D when you select the appropriate map. The selection should look something like this (note that DTX has an extra entry for Marine Events which you may or may not want to include):



NOTE: The cron runs at :30 intervals. In order to accommodate those coming in on midnight shifts, between 8PM and 11:59 PM local, the “Today” map will include events from the current time through the end of the **upcoming** day, while the “Tomorrow” map will include events **2 days from the current date.**

You can restart your D2D at any time to see the most recent DSS catalog.

10. Contact Information

These instructions were written by Phil Kurimski from the WFO Office in Detroit/Pontiac, Michigan and Evan Bookbinder from the WFO in Kansas City/Pleasant Hill, MO. Without the guides from Doug Speheger (2004; 2005) and Mike Dangelo (2013) this project would not exist. If you have any questions regarding implementation of DSS events in WarnGen or D2D please contact Phil by email at Phil.Kurimski@noaa.gov and Evan at Evan.Bookbinder@noaa.gov

11. References

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